



## **Millennium Hotel – Boulder, Colorado**

### **April 8 – 11, 2014**

Key components of our global infrastructure and economy are at risk from space weather. Modern society depends on reliable access to advanced technologies such as GPS, satellite communications, and a stable energy distribution network. No other natural occurring phenomenon has the potential to be so far reaching in its impact to mankind. Consequently, space weather mitigation strategies are being addressed by many nations. Meeting the space weather needs is beyond the capability of any single agency or country, and we recognize that society is best served by the ability of all nations and all sectors - public, private, and academic to work together as partners to meet our common goals to plan, prepare and respond to space weather storms.

The 2014 Space Weather Workshop will bring together the diverse elements of the space weather community. Representatives from research centers, the commercial space weather services sector, international organizations, and several federal government agencies will participate in a variety of sessions relevant to space weather. Topics include:

- The economic effects of geomagnetic storms on electric utilities, commercial aviation services and satellite navigation systems such as GPS.
- The international coordination of space weather activities from space weather service organizations around the globe.
- Advances in space weather modeling, and the emerging needs of the operational and forecasting community.
- The development and implementation of spacecraft and instruments of value for both research and operations.
- Recent research regarding solar cycles past and present and long term trends in space weather.

In addition to the plenary sessions there will be poster sessions and a roundtable discussion about growing the space weather enterprise. The roundtable consists of a panel represented by distinguished members of the public and private sectors. The Wednesday evening banquet will be held at the University of Colorado, Folsom Field Stadium Club and feature Fran Bagenal, Professor of Astrophysical and Planetary Sciences, Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, presenting “A Romp Through the Outer Solar System.”

Space Weather Workshop 2014 is co-sponsored by the NOAA Space Weather Prediction Center, the NSF Division of Atmospheric and Geospace Sciences, and the NASA Heliophysics Division.

<http://www.spaceweather.gov/sww>

# 2014 Space Weather Workshop Agenda

Millennium Hotel Ballroom

## Tuesday, April 8

- 8:30**      **Conference Welcome**  
William Murtagh, NOAA/SWPC
- 8:40**      **Space Weather Morning Forecast**  
SWPC Space Weather Forecasting Office
- 8:50**      [State of the Space Weather Prediction Center](#)  
Brent Gordon, NOAA/SWPC
- 9:10**      [Solar Max – It's Here, Finally](#)  
Doug Biesecker, NOAA/SWPC
- 9:30 – 10:30**    **Geomagnetic Disturbances and the Electric Power Grid**  
**Chair:** William Murtagh, NOAA/SWPC
- 9:30**      [The Major Solar Eruptive Event in July 2012: Defining Extreme Space Weather Scenarios](#)  
Daniel Baker, University of Colorado, Boulder
- 9:50**      **North American Electric Reliability Corporation (NERC) Geomagnetic Storm (GMD) Standards**  
Frank Koza, PJM Interconnection
- 10:10**      **Establishing the Geomagnetic Disturbance Benchmark Event for Evaluation of the Space Weather Hazard on Power Grids**  
Antti Pulkkinen, NASA
- 10:30**      **Break**
- 10:50 – 11:50**    **Geomagnetic Disturbances and the Electric Power Grid, Continued**  
**Chair:** William Murtagh, NOAA/SWPC
- 10:50**      [Defense Threat Reduction Agency \(DTRA\) Magnetohydrodynamic \(MHD\)-E3 Phase IVB: Measured Harmonic Response of Power Grid Transformers Subjected to Severe E3/GIC Currents](#)  
Amber Walker, Scientific Applications & Research Associates (SARA)
- 11:10**      [Progress and Challenges in Specifying Geomagnetic Activity for the Electrical Power Grid](#)  
Chris Balch, NOAA/SWPC
- 11:30**      **FEMA and Space Weather**  
L.A. Lewis, FEMA
- 11:50 – 12:00**    **Aviation and Space Weather**  
**Chair:** Robert Rutledge, NOAA/SWPC
- 11:50**      [Space Weather Ballooning](#)  
Tony Phillips, Spaceweather.com

- 12:00      Lunch**
- 1:00 - 2:30      Poster Session – Operational Space Weather Services and Analysis Tools and Magnetosphere Research and Applications**
- 2:30 - 5:20      Aviation and Space Weather**  
**Chair:** Robert Rutledge, NOAA/SWPC
- 2:30      [An Epidemiologic View of Low Dose Ionizing Radiation and Cancer: Putting Risk into Perspective](#)**  
 Alice Sigurdson, National Cancer Institute
- 3:00      [Aircrew Dosimetry: Monitoring and Operational Services in France](#)**  
 Nicole Vilmer, Observatoire de Paris
- 3:20      [WASAVIES: Warning System for Aviation Exposure to Solar Energetic Particles](#)**  
 Yuki Kubo, National Institute of Information and Communications Technology (NICT)
- 3:40      [Progress Towards Maps of Ionizing Radiation at Altitude \(MIRA\): The new Civil Aeromedical Research Institute \(CARD\)-7 and Enhanced Solar Radiation Alert \(ESRA\)](#)**  
 Kyle Copeland, FAA
- 4:00      Break**
- 4:20      [A New Space Weather Index for Aviation](#)**  
 Matthias Meier, German Aerospace Center (DLR)
- 4:40      [Health Standards for Long Duration and Exploration Spaceflight: Ethics Principles, Responsibilities, and Decision Framework](#)**  
 Ron Turner, Analytic Services Inc (ANSER)
- 5:00      [Increasing Biological Hazards from Solar Energetic Particles and Galactic Cosmic Rays](#)**  
 Nathan Schwadron, University of New Hampshire
- 5:20      End of Session**
- 5:45 - 7:45 pm      8<sup>th</sup> Annual SWPC - Commercial Space Weather Interest Group (CSWIG) / American Commercial Space Weather Association (ACSWA) Summit Meeting (Invitation only)**

## **Wednesday, April 9**

**8:30-8:40**      **Space Weather Morning Forecast**  
SWPC Space Weather Forecasting Office

**8:40-10:10**    **Commercial Space Weather Interest Group (CSWIG)/  
American Commercial Space Weather Association (ACSWA) Roundtable Session:  
Growing the Space Weather Enterprise**

Keynote Speaker:

**Dr. Conrad C. Lautenbacher, Jr.**, Chief Executive Officer, GeoOptics, Inc.

*[Growing the Space Weather Enterprise: Roles and Contributions](#)*

Features Speakers:

**Mr. William Murtagh**, Program Coordinator, NOAA Space Weather Prediction Center (SWPC)

*[The View from SWPC: Utilizing the Diversity of the Commercial Space Weather Industry](#)*

**Dr. Tamara L. Dickinson**, Principal Assistant Director for Environment and Energy, Assistant Director for Disaster Resilience and Space Science, Office of Science and Technology Policy (OSTP), Executive Office of the President

*The View from OSTP: Building and Coordinating the National Space Weather Strategy*

Moderator and Organizer: **Dr. Devrie Intriligator**, Director, Space Plasma Laboratory, Carmel Research Center, Inc.

**10:10**      **Break**

**10:30 - 12:10** **Agency Activities**  
**Chair:** Brent Gordon, NOAA/SWPC

**10:30**      **Space Weather Research at the National Science Foundation**  
Richard Behnke, National Science Foundation

**10:50**      [NASA Heliophysics Division](#)  
David Chenette, NASA

**11:10**      **United States Air Force Weather Agency**  
Colonel David Bacot, USAF

**11:30**      [National Weather Service](#)  
William Lapenta, NOAA/NWS/NCEP

**11:50**      [National Environmental Satellite, Data, and Information Service \(NESDIS\)](#)  
Patricia Mulligan, NOAA/NESDIS

**12:10**      **Lunch**

**1:00 - 3:00     Poster Session - Solar and Interplanetary Research and Applications**

**3:00–3:20     Special Presentation**

**3:00           Solar Terrestrial Relations Observatory (STEREO) as a “Planetary Hazards” Mission**  
Madhulika Guhathakurta, NASA

**3:20 - 5:00     [Space Weather Impacts: An Insurance Industry Perspective](#)**  
**Chair:** Jason Reeves, Zelle Hofmann

**Panelist**

David Wade, Atrium  
Reto Schneider, Swissre  
Emma Rio, Swissre  
Jason Reeves, Zelle Hofmann

**5:00           End of Session**

**6:00 - 9:00     Reception Dinner at University of Colorado, Boulder – Folsom Field Stadium Club**

Special Guest Speaker:  
Fran Bagenal,  
Professor of Astrophysical and Planetary Sciences, Laboratory for Atmospheric and Space Physics,

“A Romp Through the Outer Solar System”

Folsom Field Stadium Club  
2400 Colorado Ave  
Boulder, CO 80302

## **Thursday, April 10**

- 8:30 - 8:40**    **Space Weather Morning Forecast**  
SWPC Space Weather Forecasting Office
- 8:40 - 10:40**    **International Coordination of Space Weather Activities**  
**Chair:** Terry Onsager, NOAA/SWPC
- 8:40**    [\*\*A COSPAR/International Living With a Star \(ILWS\) Roadmap Towards Advanced Space Weather Science to Protect Society's Technological Infrastructure\*\*](#)  
Karel Schrijver, Lockheed Martin
- 9:00**    [\*\*WMO's Role in the Development of Space Weather Service Delivery Requirements for International Aviation\*\*](#)  
Ian Lisk, UK Met Office
- 9:20**    [\*\*WMO and Coordination Group for Meteorological Satellites \(CGMS\) Involvement in Space Weather\*\*](#)  
Jerome Lafeuille, WMO Space Programme
- 9:40**    [\*\*Space Weather Initiatives at the UN Committee on the Peaceful Uses of Outer Space\*\*](#)  
Mangala Sharma, U.S. Department of State
- 10:00**    [\*\*New International Space Environment Service \(ISES\) Website and Forecaster Discussion Tools\*\*](#)  
Sunhak Hong, Korean Space Weather Center
- 10:20**    [\*\*Advanced Forecast For Ensuring Communications Through Space \(AFFECTS\)- A Multi-Institution Research Project to Mitigate Space Weather Hazards\*\*](#)  
Jens Berdermann, German Aerospace Center (DLR)
- 10:40**    **Break**
- 11:00 - 12:00**    **International Coordination of Space Weather Activities, Continued**  
**Chair:** Terry Onsager, NOAA/SWPC
- 11:00**    [\*\*Activities Related to Space-Weather Impact on Critical Infrastructures at the EC's Joint Research Centre\*\*](#)  
Elisabeth Krausmann, European Commission
- 11:20**    [\*\*European Space Agency \(ESA\) Space Situational Awareness \(SSA\) Space Weather Services – Federated Service Concept\*\*](#)  
Juha-Pekka Luntama, European Space Agency
- 11:40**    [\*\*UK Government Progress to Build Resilience to Severe Space Weather\*\*](#)  
Mark Gibbs, UK Met Office
- 12:00**    **Lunch**
- 1:00 - 2:30**    **Poster Session – Ionosphere/Thermosphere Research and Applications**

- 3:00 - 5:00**    **Space Weather Modeling**  
**Chair:** Howard Singer, NOAA/SWPC
- 3:00**            [\*\*Whole-Atmosphere/Ionosphere Modeling at NOAA: Recent Progress and Plans\*\*](#)  
Rashid Akmaev, NOAA/SWPC
- 3:20**            [\*\*Forecasting Solar Flares: Status and Recent Developments\*\*](#)  
KD Leka, Northwest Research Associates
- 3:40**            [\*\*The Space Weather Modeling Framework \(SWMF\)-Geospace Capabilities for Transition to Operations\*\*](#)  
Tamas I. Gombosi, University of Michigan
- 4:00**            [\*\*Rapid, Low-Cost Prediction of Geomagnetic Perturbations from Real-Time Solar Wind Measurements\*\*](#)  
Daniel Weimer, Virginia Tech
- 4:20**            [\*\*Community Coordinated Modeling Center: Prototyping and Accelerating Implementation of Advanced Space Weather Models and Forecasting Systems\*\*](#)  
Masha Kuznetsova, NASA
- 4:40**            [\*\*Transitioning Research Models into Operations\*\*](#)  
George Millward, SWPC/NOAA
- 5:00**            **End of Session**

## **Friday, April 11**

- 8:30 - 8:40**     **Space Weather Morning Forecast**  
SWPC Space Weather Forecasting Office
- 8:40 - 10:20**   **Space Based Observations and Advances**  
**Chair:** Rodney Viereck, NOAA/SWPC
- 8:40**            [National Geophysical Data Center \(NGDC\)](#)  
Eric Kihn, NOAA/NGDC
- 9:00**            [Solar Energetic Particle Measurements Intercalibration Workshop: Today's Topics and Long-Term Goals](#)  
Juan Rodriguez, NOAA/NGDC
- 9:20**            [Solar Proton Events of Solar Cycle 24](#)  
Richard Mewaldt, Caltech
- 9:40**            [The Van Allen Probes and New Results Relevant to Space Weather](#)  
Harlan Spence, University of New Hampshire
- 10:00**          **Responsive Environmental Assessment Commercial Hosting (REACH) Demonstration**  
Dan Kimmich, USAF/ SMC/XR
- 10:20**          **Break**
- 10:40 - 12:00** **Space Based Observations and Advances, Continued**  
**Chair:** Doug Biesecker, NOAA/SWPC
- 10:40**          [Forecasting Daily EUV Solar Irradiance for Atmospheric Models](#)  
Rachel Hock, USAF AFRL
- 11:00**          [IMPACT: Integrated Modeling of Perturbations in Atmospheres for Conjunction Tracking](#)  
David Thompson, Los Alamos National Laboratory
- 11:20**          [Space Weather Observations from the GOLD Mission](#)  
Richard Eastes, University of Central Florida
- 11:40**          [COSMIC-2: A Platform for Advanced Ionospheric Observations](#)  
Paul Straus, Aerospace Corp.
- 12:00**          [Workshop Closing](#)  
Brent Gordon, NOAA/SWPC
- 12:10**          **End of Conference**